

MONTREAL AND OTTAWA RAILWAY.

GENERAL SPECIFICATION AND FORM OF TENDER.

1. The works to be done comprise clearing, close-cutting, grubbing, earth excavation, rock excavation, masonry, rip-rap, farm crossings, and all other work necessary to fully complete a first class single track railway up to sub-grade, except the construction and erection of the iron superstructure of the Bridges. ^{Work to be done}

CLEARING, CLOSE-CUTTING AND GRUBBING.

2. Where the line passes through wooded land, the entire right of way must be cleared of all the timber, brush, stumps, etc., which must be either burned or removed from the right of way. No timber, brush, stumps or roots shall in any case be piled upon adjacent lands. ^{Clearing}

3. Where embankments are less than four feet and more than 18 inches, all trees and stumps are to be cut off close to the ground. ^{Close cutting}

4. In excavations less than three feet and embankments less than 18 inches, all trees and stumps must be grubbed out within the limits of such cuttings, ditches, drains or embankments, but in no cases shall grubbing be paid for in borrow-pits. ^{Grubbing}

5. In swamps or soft places, if so directed by the Engineer, a cross-way of such breadth as he may direct shall be constructed of a depth of one foot or such greater depth as may be considered necessary. Said logs to be placed close together and to be not less than six inches in diameter and finally closely covered with brush. No ditches to be made on either side of such crossway unless with the permission of the Engineer. The work will be paid for at so much per acre on a basis of one foot in depth of timber. ^{Crosswaying}

GRADING.

6. No grading shall be commenced upon any cutting or embankment until the clearing, close-cutting and grubbing required shall be completed to the satisfaction of the Engineer. ^{Time of commencement}

7. The Contractor for grading will, in most cases, require to commence work before the fencing is built and it is clearly understood that he is to be responsible for all damage to crops on adjoining land, by reason of any damage that may be caused by the existing fences being removed or thrown down, either by men in his employ or by any one else in the employ of the company. ^{Responsible for damage to crops}

8. The work to be done consists of excavation and formation of embankments necessary for the construction of a single track railway and includes all sidings, road diversions, farm crossings, levelling of station grounds, &c., &c. ^{Extent of work}

Width of cuttings and embankments

9. The general width of cuttings shall be 22 feet in width, but when material is required to make up fills, the cuttings must be widened for this purpose as required by the Engineer before borrowing from any other source. All embankments shall be at least 16 feet in wide at sub-grade. Where material is not required to make up embankments, the cuttings may be narrowed in accordance with the instructions of the Engineer.

Ditches.

10. In rock cuttings, a water channel must be formed two feet wide and eight inches deep on each side of the roadway.

All side ditches are to be graded so that no water will stand in them, they are to be executed in strict accordance with the lines and grades to be given; they are to be properly sloped and left clean and free from all obstructions. The tops of these ditches are in no case to be nearer the foot of the slopes of the embankments than five feet.

Underdrains

11. All side-hill ground that is wet or spongy or likely to be affected by water must be thoroughly underdrained so that no water will lodge between the new bank and the old ground. The drains are to be put in as directed by the Engineer, trenches will be cut longitudinally and transversely to a depth of about four feet and eighteen inches in width, in the bottom of these trenches, tiles of such dimensions as the case may require, or from three to six poles averaging about five inches in diameter, will be laid breaking joint, these are to be covered with brush and where possible with 12 inches of gravel or small stones and then filled in with the earth taken out of the excavation. Similar drains to these are to be put in wet cuttings where directed by the Engineer, they will be paid for at so much per lineal foot, the Contractor to find all the materials for the same.

Catchwater drains

12. Catch-water ditches must be made along the tops of the excavation where required to keep water from flowing into the cuttings.

Berm

13. In cuttings partly earth and partly rock a berm of six feet will be left on the surface of the rock unless otherwise directed by the Engineer.

Precaution on side-hill grounds

14. Where embankments are to be on side-hill grass land upon which the new work would, in the opinion of the Engineer, have a tendency to slide, the Contractor shall have the surface broken up by deep ploughing before commencing the embankment.

Materials in embankments

15. The materials to be placed in embankments must be approved by the Engineer. All materials found in excavation, whether in road bed cuttings, ditches, water channels, roads crossings or elsewhere must be deposited in such places as the Engineer may direct.

Borrowing

16. In cases where the road-bed excavations are insufficient to form embankments, the deficiency will generally be made by widening the cuts and by putting ditches through them, but there will be special cases where other means of obtaining earth for embankments may be permitted by the Engineer, but in no case will the Contractor be allowed to borrow without the consent in writing of the Engineer.

Wasting

17. No wasting on the sides of the cuttings or on the sides of the ditches will be allowed; where there is an excess of excavation, this surplus must be used for widening the embankments or for such other purposes as the Engineer may direct.

18. Excavation will be classed under two heads, viz : *Solid Rock*, Classification and *Earth* and will be paid for according to the following definitions.

19. All stone and boulders found in excavation measuring more Solid rock than 27 cubic feet, and all solid quarry stone requiring blasting in order to remove it shall be termed *Solid Rock*.

20. All other excavation of whatever kind shall be termed *Earth* Earth *Excavation*.

21. The contract prices for the several classes of excavation shall be Extre haul taken to include the cost of depositing the material in the embankment and all other expenses connected therewith except extra haul, which will only be paid for where it exceeds 1000 feet at so much per yard per additional 100 feet.

22. All excavations to be neatly dressed to the required slopes. Dressing slopes

23. No rock excavation will be allowed for beyond the limits of the base and slopes as specified. All rock loosened by explosives beyond Rock outside of limit of base of slopes the slope must be removed at the expense of the contractor, but if required to make up the embankment will be paid for as earth.

24. In cases where pitching or rip-rapping will be required, for the protection of embankments contiguous to streams, all stone suitable for this work found in excavations may be removed and deposited in some convenient place until required, and all good building stone which may happen to be found in rock excavations, may, with the approval of the Engineer, be preserved and used in masonry; but any material so found and used will not be paid for twice, the quantity will form a deduction from the quantity of excavation as measured in the cutting. Building materials in excavations

25. Roads constructed to and from any point on the line of railway Service roads for the convenience of the contractor, for the conveyance of material or otherwise must be at his own risk, cost and charges, but the Company Land will provide the necessary land for the right-of-way and borrow pits.

26. Wherever the line is intersected by public or private roads, the contractor must keep open at his own cost convenient passing places, and he shall be held responsible for keeping all crossings, during the progress of the works, in such condition as will enable the public to use them with perfect safety, and such as will give rise to no just ground of complaint. Contractors will be held liable for any damages resulting from negligence on their part or that of their men in this respect or any other respect. Road Crossings.

27. Whenever any material is met with in the excavations which Ballast the Engineer shall consider suitable and required for ballast, the same shall at his discretion be reserved for that purpose.

28. When slips occur in cuttings, after they are properly formed, Slips the material must immediately be removed by the contractor, the slopes reformed and such precautions adopted as the Engineer may deem necessary. The contractor will be paid for the removal of slips at his schedule price.

Loose stones
backing to
walls

29. In forming embankments, great care must be taken to place against the backs of all walls exposed to the action of frost, rip-rap backing consisting of small stones blinded with spawls or coarse gravel, to prevent the retention of moisture and the action of frost thereon, the Engineer to decide in each case the depth and thickness of such rip-rap. And in forming embankments between wing walls, against abutments of bridges, viaducts or culverts and over arches, the earth filling must be carefully packed or punned in thin layers, and a proper quantity of material must be carefully placed equally against each side of and over all bridges, culverts or other work, before the embankment approaches it, and in forming embankments, the greatest care must be observed and every precaution must be taken to load the masonry of structures evenly. The price for excavation must be considered sufficient to cover the cost of punning. The loose stone backing to walls above referred to, will be paid for as rip-rap.

Filling
against
masonry

Measurement
in excavation

30. The measurement of quantities shall invariably be made in excavation, unless in special cases where this may be found impossible, in such cases the Engineer shall determine the quantities in embankment, after making all proper allowances for shrinkage, of which he shall be the judge.

Prices to
cover every
contingency

31. The prices stipulated for excavation of the several denominations, together with the price for haul, shall be the total prices for excavating, loading, removing and depositing all the material, in a word the rates and prices stipulated in the contract must be understood to cover every contingency, the furnishing of all labour, material, power and plant, the cost of finishing up cuts and embankments, the dressing and draining of borrowing pits when required, the dressing of slopes to the required angle, and the completing of everything connected with the grading of the road bed in a creditable and workmanlike manner, in accordance with the directions and to the satisfaction of the Engineer.

TIMBER WORK.

Quality of
timber

32. The timber used in all truss or trestle bridges and culverts, must be of the very best description of the kind required, free from all loose, large or unsound knots, sap, sun cracks, shakes, wanes more than one inch across, or other imperfections; it must be sawn or hewn square and out of wind and when delivered, must in every way conform to the specification and must come fully up to the dimensions called for in the bills and drawings.

Stringers

33. The stringers in all cases must be of the best class of white pine or tamarac, and must, in addition to the requirements above mentioned, be free from all sap, knots, wanes or anything else that would impair their transverse strength.

Posts, sills,
caps, ties and
cattle-guards
and culvert
timber

34. The posts, sills and caps, for trestles must be of good sound white pine. Special ties for the deck of trestles will be required. Mud-sills in all cases to be of cedar. The timber for cattle-guards and culverts shall be of cedar (except the cattle-guard stringers, which must be of pine, white oak or rock elm).

Inspection

35. Inspection will be made when delivered on the Company's ground, or any other place pointed out by the Engineer.

36. The Company reserves the right at any time to change the bills of timber, vary the dimensions, substitute one kind of structure for another, or increase the number of the same (providing always that none of the material has been cut at the mill or delivered on the ground), without the contract price being thereby affected, or in any way rendering void the contract for the original figures. Alterations in bills of timber, etc.

37. In delivering timber, it must be piled or placed in such a manner that no trouble will be experienced when inspecting or measuring it. Mode of delivery

38. White oak or rock elm pins of such dimensions, of such shape, and in such numbers as deemed necessary by the Engineer, shall be used in pinning in a proper manner the timbers in all culverts and cattle-guards. Pins

39. All framing must be made to fit closely, and must be done in a thorough, and workmanlike manner, no open joints or filling pieces will be allowed. All surfaces, where wood touches wood, in trestles and bridges, must be thoroughly painted, before being put together, with a good coat of white lead. Framing

40. Mortices and tenons to be well and truly made, and all bedded in white lead ; all ends of timbers to be painted with white lead. Protection from moisture

41. Each structure must be under the supervision of a first-class practical bridge foreman ; and any foreman or workman who, in the opinion of the Engineer, is not competent, must be at once discharged. Supervision

42. The price per lineal foot, or per thousand feet, board measure, is understood to cover all expense incurred in teaming and completing the structures to the satisfaction of the Engineer. Price to cover all cost

43. Piles shall consist of white oak, tamarac, rock elm, or other approved timber ; must be straight and sound throughout, and shall not measure less than ten inches in diameter at the small end, not including the bark. When required, a detailed plan will be furnished by the Engineer, showing their position and method of tenoning, bolting, &c., and they shall be driven to such a limit of resistance as the Engineer shall determine. The Contractor must properly point each pile for driving, and supply and fix all rings for heads, also shoes where necessary. Piles

44. Should any pile be broken in driving, another sound pile must be driven in its place at the expense of the Contractor. During the progress of the driving, wrought iron bands must be supplied by the Contractor. Broken piles

45. The piles to be paid for at so much per lineal foot, measured in the finished structure, which will include all work in connection therewith, including cutting off, squaring, lining up, tenoning, &c., &c. Piles, how measured

IRON IN TIMBER WORK.

46. All wrought iron used in the construction of the bridges, trestles, foundations or other work, to be of the very best quality, to stand a tensile strain of 55,000 lbs. per square inch, and to stand bending over around its own diameter without shewing signs of any flaw or crack. Wrought iron

Cast iron
Price

47. All castings to be made of best grey iron, and, when finished, to show a clean smooth surface, free from holes, cinders or other imperfections. All iron will be paid for at so much per pound in the work.

FOUNDATIONS, MASONRY, CEMENT AND CONCRETE.

48. All masonry shall be built according to Canadian Pacific Railway Company's general specifications for First Class Masonry dated 13th February, 1896, and for Rubble Masonry according to that Company's general specifications dated 9th April, 1892.

RIP-RAP, ETC.

Hand-laid
rip-rap.

49. Embankments, at such points as may be designated, will be protected with hand-laid rip-rap, which is to have a thickness of three feet at the ground, and two feet at the top, the stones are to be placed on edge at right angles to the slope of embankments, no stones are to be used having a less depth than 18 inches. The top of the work is to be finished with a coping two feet deep, having a face width of nine inches, and to be not less than three feet long.

Loose rip-rap.

50. Such points as the Engineer may direct, are to be protected with ordinary loose rip-rap, to such a height and width as he may consider necessary. The same class of rip-rap will be used behind walls of abutments, &c.

GENERAL.

Alterations.

51. The Engineer shall at any time, either before the commencement or during the construction of any portion of the work, be at liberty to make any alteration or change that he may deem advisable either in the grades or alignment, the width of cuttings or embankments, the dimensions or character of structures, or in any other things connected with the works, whether the same increases or diminishes the quantities, and the Contractor shall only be allowed at the same rate as in his Schedule of Prices attached, and no extras of any description will be allowed. The rates and prices in the Schedule must be understood to include not only the particular work or material mentioned, but also all and every kind of work, labor, tools, plant, and materials, of whatsoever kind, necessary for the full execution and completion, ready for use, of the respective portions of the works, to the satisfaction of the Engineer.

Manner of
carrying on
the work.

52. The Contractor shall carry on the works at such places and in such a manner as he shall be directed from time to time by the Engineer.

Slips in
earth-work.

53. The Contractor will be held responsible for all work that may prove defective, owing to bad material or workmanship supplied by him, or through want of proper precaution, previous to the granting of the final certificate.

Insufficient
workmen or
material.

54. If at any time the number of workmen or horses, or the amount of material or other plant shall, in the opinion of the Engineer, be insufficient for the due completion of the works in the time specified, or that the works are, or some part thereof, is not being carried on with due diligence, then in every such case the said Engineer shall have the power to notify the Contractor in writing to employ or provide such additional workmen, horses, material or plant as the said Engineer may think necessary; and in case the said Contractor shall not thereupon,

within three days or such longer time as may be fixed by any such notice, in all respects comply therewith, he the said Engineer shall have power to provide any workmen, horses, material or plant he may think proper, and all moneys so expended by the Company shall thereupon be paid by the Contractor, or may be deducted or retained out of any moneys due or to become due to the Contractor, and should these moneys be insufficient, the balance shall be recoverable in the usual way as a debt due by the Contractor to the Company.

55. In case any material is, in the opinion of the Engineer, not in accordance with the terms of the Contract, and is condemned as unsuitable or inferior, it shall at once be removed by the Contractor from the works, or should this not be done, the Engineer may, on giving three days' notice, cause the same to be removed, and the cost of such removal shall be deducted from any moneys due or to become due to the Contractor. Removal of condemned material.

56. If any work or service be required to be done which is not named in the "Schedule of Prices," the Engineer shall be at liberty to direct the Contractor to perform the same, paying him the actual cost of any such work or material, with an addition of ten per cent, to cover the use of tools and profit. Work not mentioned in schedule of prices.

57. In the absence of the Contractor, a competent agent or foreman shall represent him on the works, who shall be considered the lawful representative of the Contractor, and any orders given to such agent or foreman shall be deemed given to the Contractor. Contractor's representative.

58. The Company will provide the necessary land for the right of way of the Railway, and borrow pits, but the Contractor will have to provide at his own cost any land required for procuring material or conducting his operations. Land by whom provided.

59. When considered necessary by the Engineer, detailed drawings of the different structures will be furnished to the Contractor from time to time as the work progresses. Detailed drawings of structures.

60. Cash payments, equal to 90 per cent. of the value of the work done and material delivered, approximately made up from returns of progress measurements, and computed at the schedule prices, shall be made to the Contractor monthly, on the written certificate of the Engineer, that the work on account of which the certificate is granted has been executed to his satisfaction. The remaining ten per cent. shall be retained until the final completion of the whole work to the satisfaction of the Engineer, and shall be paid within two months after such final completion, but such progress, measurements or certificates shall not in any respect be taken as an acceptance of the work or release of the Contractor from responsibility in respect thereof, but he shall at the conclusion of the work deliver over the same in good order. Mode of payment.

61. The wages of all persons, of any class, employed upon or in respect of any of the said works, shall be paid at least once a month: if possible, said payment shall be made upon the works or some point convenient to the same, but in no case at a tavern or other place where liquors are sold. Payment of wages.

62. The Contractor, or any person directly or indirectly employed by him, shall in no case establish any tavern, or store, or other place for the supply of liquors or other intoxicating drinks. Selling of liquor by Contractor.

Power to
enter upon
works

63. The Company retains the right to enter upon the works at any time, and to carry on any work that may be considered necessary by the Engineer, in order to erect the iron superstructure of the bridges or any other work that may be required by the Company, and it is to be understood that this taking possession of the piers and abutments as they are ready for the superstructure, or other portions of the work, is not to be considered a final acceptance of the work thus taken possession of.

Damages to
adjoining
property.

64. The Contractor will be held responsible for any damage done by himself or parties in his employment to property adjoining the railway.

Employees.

65. The Contractor shall employ mechanics for every species of mechanical work. No stone work of any quality shall be laid by other than regular masons who have served their time as such. The employees of the Contractor shall at all times obey the directions of the Engineer or his deputies with respect to the work; and if any overseer, agent or workman of the Contractor shall be found unfaithful or incompetent by the Engineer, or shall neglect or refuse to obey all reasonable orders of the Engineer or his deputies, or shall have promoted disturbance upon the work, the Contractor shall, on being required so to do by the Engineer, at once discharge said person, and shall no longer employ him upon the work.

Extra work.

66. No allowance will be made for extra work, except upon a written agreement signed by the Contractor and the Engineer, or under the written order of the Engineer. All claims for extra work so ordered must be made to the Engineer in writing before the payment of the next succeeding estimate after the work was performed, and failing to make such claim, the same shall be considered as abandoned by the Contractor.

Sub-letting.

67. The Contractor will not be permitted to sub-let any portion of this work without the consent of the Company, and their approval of the sub-Contractor; which consent or approval, however, shall by no means be considered a recognition of such sub-Contractor. The Contractor shall be bound at all times to have an office on the works, or at _____, where, by himself or some authorized agent, all notices or requisitions from the Company or the Engineer may be received and acknowledged.

Stakes and
bench mark.

68. All grades, dimensions, etc., will be given by the proper stakes and bench marks, such stakes and bench-marks must be preserved by the Contractor until the prosecution of the work requires their removal. If the Contractor, in a careless or wilful manner, removes or causes the removal of any of said stakes or bench-marks before the prosecution of the work requires it, the expense of replacing them will be charged to the Contractor, and the amount deducted from the amount due on his final estimate.

Right of way.

69. The Company will use due diligence in securing the right of way, but will not be responsible for delays in this connection. All such delays shall only have the effect of entitling the Contractor to additional time for the completion of his work. The Engineer to be the judge as to the loss of time and the additional time to be allowed the Contractor for the completion of his contract.

70. All works are to be done to the entire satisfaction of the Engineer to be sole judge of the work. He is to be the sole judge of work or material, in respect both of quality and quantity, and his decisions on all questions of dispute, with regard to the work or materials, or as to the meaning or interpretation of the plans or specifications is to be considered final and binding on all parties.

